The Office of Vince Ryan
County Attorney

May 27, 2016

National Remedy Review Board
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
MC 5204P
Washington, DC 20460-0001

Re: Updated Response to Request for Harris County's Recommendation for Remedy of San Jacinto River Waste Pits Superfund Site

To the National Remedy Review Board:

The Environmental Protection Agency (EPA) scheduled a National Remedy Review Board (NRRB) meeting for the San Jacinto River Waste Pits Superfund Site (Waste Pits Site) located in Harris County for June 2016. The EPA has advised Harris County that it can provide a summary of its recommended and preferred remedy for the Waste Pits Site for the NRRB's review and consideration. This letter is a supplement to the letter that Harris County provided to the EPA on May 1, 2014 for the NRRB, which is attached.

**Executive Summary.** Because of conditions at the Waste Pits Site and other information set forth in this letter and its attachments, Harris County requests removal of the dioxin-contaminated sludge. Removal of the sludge is the only permanent and effective method to protect human health and the environment. As explained below, Harris County believes that every effort should be made to remove contaminated soils and remove as much sediment as required to achieve the 16 nanograms/kilogram (ng/Kg) State of Texas fish tissue standard for dioxin.

**Overview.** The people of Harris County are directly affected by the dioxin waste at the Waste Pits Site, and as the local government Harris County appreciates this opportunity to explain why the remedy for cleaning up the 2,3,7,8-TCDD – referred to by the EPA as being considered the most toxic of dioxins – should be the removal of the dioxin waste from the Waste Pits Site. As recently as May 24, 2016, at an Open House Forum hosted by the EPA, the Community voiced its overwhelming support for removing the dioxin contaminated sludge from the midst of the San Jacinto River and their Community. Harris County believes that the unique circumstances surrounding this Waste



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Pits Site demonstrate that the removal of the dioxin waste from the partially submerged Waste Pits Site and the San Jacinto River sediments is the only remedy that can effectively and permanently address the continuing potential and actual threat to human health and environment it poses to Harris County, the San Jacinto River, and Galveston Bay.

Recent numerous failures of the temporary cap establish beyond reasonable dispute that leaving the dioxin contaminated sludge in place is not a viable, safe, or effective remedy. The EPA is aware of the cap's multiple failures, and for that reason Harris County summarized only the more dramatic cap failures in this letter. On December 21, 2015, the EPA advised Harris County that a breach in the rock cap covering the Waste Pits Site had occurred and had been discovered by an EPA dive team during an underwater survey of the Waste Pits Site on December 10-11, 2015. Site surveys showed a gap in the rock cap cover of approximately 20 feet in length in an area where no protective liner was installed when the cap was initially constructed. In addition, photographs from March 15, 2016 taken of the equipment used to repair the cap show it adrift in the San Jacinto River as a result of the river cresting. On May 24, 2016 the EPA provided Harris County with the April 3-9, 2016 Summary Report that demonstrated that on 56% of the samples (10/18) collected within the area of the cap had no rock cover and the remaining 44% (8/18) had sparse rock or gravel. Harris County understands that as of the date of this letter the United States Army Corps of Engineers (USACE) is studying the cause of the loss of the rock cover for the geomembrane placed over the dioxin-contaminated sludge. As early as July 31, 2012, the EPA noted multiple failures in the cap in a letter to David Keith at Anchor QEA regarding Time Critical Removal Action (TCRA) Cap Repair. USACE noted structural and design problems with the cap in its November 2013 review of the cap. The cap has failed to maintain its integrity with heavy rainfall and flooding conditions and, therefore, it would be expected to suffer further catastrophic failure if it were in the path of a tropical storm or a hurricane. In addition there is a great concern that during a storm event some of the large number of barges docked nearby will break loose and slam into the cap, destroying large sections, and exposing dioxin sludge to the environment to be washed downstream in the river and into fisheries of Galveston Bay.

**Waste Pits Site.** The San Jacinto River Waste Pits are located in a sensitive marsh, in an underwater and aquatic environment, in submerged sediments, in a major floodplain, in the direct path of a critical floodwater pathway, and they are subjected to frequent and severe impacts from major hurricanes, storms, tidal action, tropical depressions, flooding and continuing subsidence that are common to this area near the Gulf of Mexico. Because of this even the interim "cap" that the EPA had to require to be put into place as part of the TCRA through the issuance of a Unilateral Administrative Enforcement Order has been shown to be unable to withstand the tidal forces and the most routine of storm events, further demonstrating that an in-situ or in-place remedy is not appropriate.

Most compelling of all, the EPA, the State of Texas and Harris County have well-documented that the dioxin waste at the Waste Pits Site is in an area of heavy recreational use by the men, women and children of Harris County – including those who continue to subsistence fish near the Waste Pits Site to feed their families, and where commercial fisherman have been documented to harvest seafood destined for widespread distribution

for public consumption. Based upon the unique characteristics of the site, its locale, and the serious threat to the people of Harris County, and the sensitive environments of the San Jacinto River and Galveston Bay, the only appropriate remedy to effectively and permanently address the threats to human health and the environment is the complete removal of the dioxin wastes from the San Jacinto River Waste Pits.

## I. Harris County believes that removal of the dioxin from the Waste Pits Site and the San Jacinto River is the only alternative that would permanently and effectively address the danger and exposure of the dioxin to human health and the environment.

Protection of human health and the environment must be the foremost consideration, and the serious impacts of the dioxin contamination from the San Jacinto River Waste Pits have been well documented. These impacts include fishing advisories of fish and crabs tested from the Waste Pits Site found to be heavily laden with high levels of dioxin. This is particularly concerning because the Waste Pits themselves are a prime area for fishing, swimming and recreation by the men, women and children of Harris County. 2,3,7,8-TCDD -- one of the most highly toxic dioxin compounds known to man -- should be removed from the San Jacinto River where there are serious consequences of exposure. The Waste Pits Site conditions themselves clearly dictate that removal is the only way that would permanently and effectively eliminate exposure to humans. The dioxin contamination is located in a dynamic tidal river environment, with significant portions of it underwater, in a floodplain, in a floodwater pathway, and is subject to severe impacts from hurricanes, storms, tidal action, tropical depressions, and flooding. This is also an area of heavy recreational use, including subsistence fisherman who will continue to fish at the Waste Pits Site to feed their families.

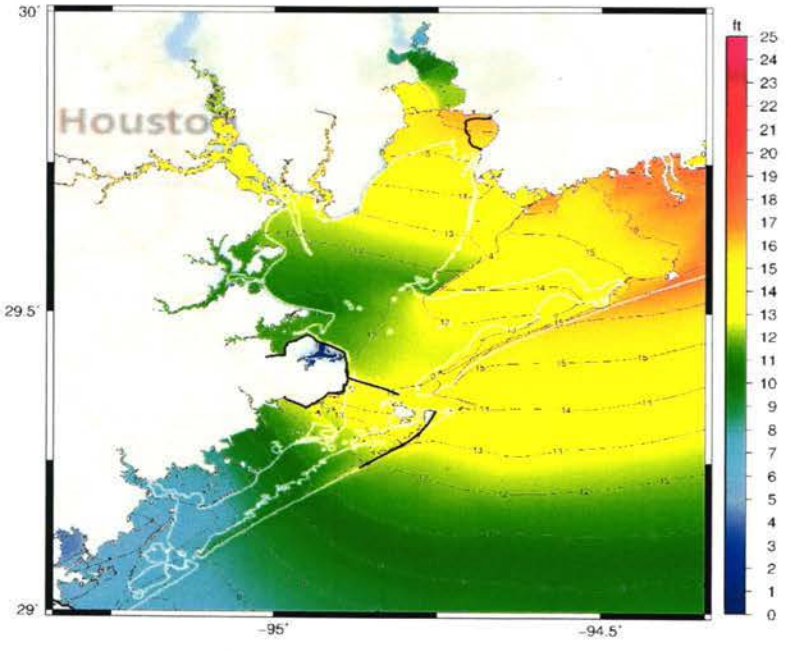
Capping, even on an interim, temporary basis, has already proven to be problematic in an area with such severe tidal and storm action. The EPA has documented failure issues with the interim western cap and had to order the responsible parties to reassess their temporary cap to include consideration of wave impacts, and bulging, and structural stability issues. The Agency was clear that "[i]t is the EPA's position that the observations listed above have increased potential threats to human health and the environment."[1] A capping remedy that leaves dioxin contamination in the San Jacinto River -- an area of subsidence, severe storm action, flooding, and tidal and wave influence -- is not appropriate at this Waste Pits Site. This is particularly true when removal of such source and principal threat material is an obvious, proven and most protective way to remove the contamination from the River and ensure that it does not continue to risk exposure to humans, the seafood they are consuming, and the environment.

[1] EPA July 31, 2012 letter to David Keith at Anchor QEA regarding TCRA Cap Repair.

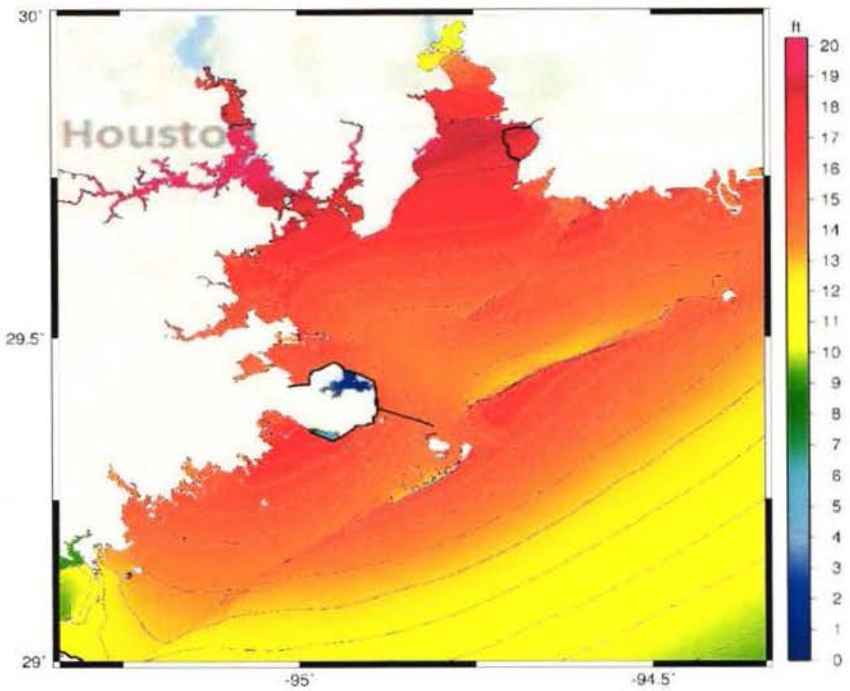
## A. Extreme Weather Events, Storms Surges and High-Flow Events.

The EPA has already documented that the area where the dioxin contamination is located is prone to extreme weather events, hurricanes, storms, floods and high-flow events that occur at the site location, including Hurricane Ike in 2008, Tropical Storm Allison in 2001 and the October 1994 Flood, just to name a few of the devastating storms that frequent the tropical climate of the Texas Gulf Coast. The EPA's October 18, 2010 letter to the responsible parties advised them that Hurricane Ike had a flow of 63,100 cubic feet per second, Tropical Storm Allison had a flow of 126,000 cubic feet per second, and the October 1994 Flood had a flow of 344,348 cubic feet per second. The proven exposure of the Waste Pits Site to severe flooding and high-flow tidal action would make any remedy that leaves the dioxin contamination in place in the River at risk to the impacts of such severe weather and dangerous tidal conditions. These storms will continue, are predictable and foreseeable, and the highly toxic dioxin material is located directly in the path of the floodplain where the storms surges will race through at great force. Removal – and not a cap or containment – is the only sure way to defend against the inevitable forces of nature of the strength and magnitude of the hurricanes, tropical storms and floods that occur in this coastal environment. The EPA's own presentations on the Waste Pits Site have noted that between 1841 and 2004, 25 hurricanes have made landfall along the north Texas Gulf Coast and seven of those hurricanes were major (Category 3 to 5). In the next 15 years, there is a 90% chance that the Waste Pits Site will be hit by a hurricane.

In such an event, the storm surge from the hurricane will have devastating effects on the Waste Pits Site. The map below demonstrates the storm surge for a hurricane with the intensity of Hurricane Ike. If such an event were to occur again, the Waste Pits Site would be hit with a storm surge of 14 feet.



The following map demonstrates the storm surge for a hurricane with Hurricane Ike's intensity directly hitting the Galveston Bay. In such a scenario, the Waste Pits Site would be hit with a 19 foot flood surge.




If a hurricane with the intensity of 115% of Hurricane Ike were to strike the Galveston Bay directly, it would cause a storm surge of 24 feet at the Waste Pits Site.

**B. Floodplain Issues.**

The San Jacinto River Waste Pits are located in one of the major pathways for floods in Harris County – one of the most frequent kinds of natural disasters visited upon this Gulf Coast area. Harris County has retained an expert hydrologist who has written a report establishing that there have been 27 major flood events in Harris County since 1965. The idea of trying to construct a cap or other in-place remedy in such a floodplain, which could impact, impair and alter the floodwater pathway routes of the River, and risk structural damage and failure due to severe storm and tidal action, among many other dangers, would not be a responsible or appropriate recommendation. To avoid altering the floodplain and pathway routes of the River, an in-situ remedy should not be implemented at this location. Due to the severity and force of floods and flash floods that hit the coastal area where the Waste Pits Site is located, the risk of breach, damage and tidal forces on treated or capped material or structures would be an unacceptable risk, which could lead to the even more widespread dispersal and transport of the 2,3,7,8-TCDD up and down the River, as well as upon residences and properties in the area impacted by flooding.

### C. Subsidence Issues.

The responsible parties and their consultant, Anchor QEA and Integral Consulting, have drafted numerous technical documents and submittals stating that the Waste Pits Site is located in an area where the lowering and movement of land and sediments from subsidence activities have contributed to the exposure of dioxin into the San Jacinto River. A remedy that contemplates leaving the dioxin in the same area, subject to such subsidence, would not be protective. Removal of the dioxin waste from areas prone to subsidence would protect against this risk and remove concerns regarding leaving dioxin in place in the water, subsurface and sediment that may be subject to instability concerns of the type raised by the Anchor and Integral reports, including subsidence issues they identified in the draft Feasibility Study (FS).

### D. Cap has Failed After Only a Few Years of Normal Weather.

The temporary cap has failed significantly after being in place only a few years. We now know that the cap cannot withstand even the normal weather events at the San Jacinto River, much less a significant weather event such as a hurricane or flooding event. In December 2015, the EPA discovered a 25-foot breach in the armored cap. Although the cause of the breach remains under investigation, it appears that the breach may have been the result of an original 2011 construction defect. How much dioxin-contaminated sludge may have escaped from that 25-foot hole is unclear. In subsequent inspections of the cap in February/March 2016, 45 other discrete areas were identified that required further maintenance. The extent recent heavy rainfall and flooding in Harris County in April/May of 2016 may have further eroded the cap is unclear because the inspection of the cap's integrity cannot be completed due to inclement weather and rainfall. But structural problems in the cap are not a new problem. In November of 2013 the USACE identified visible signs of deterioration -- less than three years after the cap was installed.[2] In November of 2013, the USACE also identified numerous structural and design flaws in the cap that raised questions about the cap's integrity, design, construction, and maintenance. Although cap inspection protocols have been revised to be more comprehensive, they remain primitive. Developing a cap inspection program that quickly and thoroughly detects cap compromises remains challenging given the site location.

### E. Significant Human Risk from Recreation, Fishing and Seafood Consumption.

The Waste Pits are located in an area of the San Jacinto River that is the locale of heavy subsistence and recreational use for boating, swimming, camping and fishing. Removal of the source material from the Waste Pits Site and the river sediment is the only

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[2] Harris County has attached copies of its letters dated September 10, 2015 and September 17, 2015 that address these issues and significant issues with the USACE draft report. It was Harris County's understanding that USACE and EPA would be circulating another draft report, but Harris County has not been provided with such a revised report.

way to ensure that humans and biota are no longer exposed to 2,3,7,8-TCDD. As has been demonstrated, even an interim in-situ remedy could not withstand the environmental forces of storms and tides for long. Given the heavy subsistence and recreational use of the area, the dioxin waste should simply be removed so that there can be no question about continued human exposure now and in the future. The very real dangers to humans and the environment from allowing 2,3,7,8-TCDD to remain in the environment are highlighted by the EPA's own findings in connection with the Waste Pits Site. The EPA documented that the type of dioxin released from the Waste Pits Site -- 2,3,7,8-TCDD -- is considered the most toxic of the dioxins, that in certain animal species, this dioxin is especially harmful and can cause death after a single exposure, that the U.S. Department of Health and Human Services has determined that 2,3,7,8-TCDD may reasonably be anticipated to cause cancer, and that the World Health Organization has determined that 2,3,7,8-TCDD is a human carcinogen.[3] Fish and shellfish tissue samples collected near the San Jacinto Waste Pits indicated that the health-based standard was exceeded in 97% of fish samples and in 95% of the crab samples. Because of the very real danger to the public, state and local regulatory agencies have actively tried to reduce exposure by educating the Community about the dangers from fishing and eating seafood from the area around the Waste Pits Site. The Texas Department of Health, the Houston-Galveston Area Council and the TCEQ have published and distributed "Dioxin for Dinner? Why Catfish & Blue Crab Can Be Harmful to Your Health." The Texas Department of State Health Services, Health Assessment & Toxicology Group, have published and distributed "Are You Eating Fish & Blue Crab from the San Jacinto River?" Seafood consumption advisories have been issued. However, fishing and consumption of seafood from the Waste Pits Site continues, including commercial sale of seafood into the public food chain. Given the extremely toxic nature of this dioxin, and the continued fishing and seafood consumption from the area, removal of the dioxin is the most protective option to human health and the environment under these circumstances.

### F. High Toxicity of Dioxin Wastes Dictate Removal.

Because of the extreme toxicity of 2,3,7,8-TCDD, a permanent remedy would eliminate the volume, toxicity and mobility of dioxin to the maximum extent possible. The EPA has already advised the responsible parties of the 40 C.F.R. 300.430(a)(1)(iii) principal threats posed by dioxin that trigger treatment – not capping – remedies, at a minimum.[4] However, because of the location and conditions of the Waste Pits Site in a dynamic river environment in a floodplain and floodwater pathway subject to severe

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[3] EPA's Findings of Fact, Unilateral Administrative Order For Remedial Investigation/Feasibility Study issued to International Paper Company and McGinnes Industrial Management Corporation, filed November 20, 2009.

[4] See EPA October 18, 2010 letter rejecting McGinnes Industrial Maintenance Corporation and International Paper's recommendation for the 10-year design for temporary cover and rejecting the responsible parties' allegations that EPA's actions in requiring a more robust design for an interim remedy was arbitrary and capricious.

impacts from hurricanes, storms, tidal action, tropical depressions and flooding that will unquestionably occur, treatment alone is not sufficiently protective in light of those impacts. The EPA has recognized the technical limitations to the long-term reliability of containment remedies – and the serious consequences of exposure should a release occur – in connection with principal threat wastes. Such wastes should be removed from the San Jacinto River because long-term source removal will eliminate the threat of exposure in a way that in-situ containment remedies -- no matter how robust -- cannot.

### G. Four Decades of Dioxin in the River is Enough.

This situation exists because the responsible parties wanted to leave their waste in the pits on the San Jacinto River more than 40 years ago. Now, 40-plus years and one Superfund Site later, it should not be an option for them to leave their dioxin wastes in the River again -- in any form. This is not an orphaned Superfund Site and the same parties who left their wastes here 40-plus years ago are still here, still in existence and can fund a removal remedy. They should be required to remove their material from the sensitive eco-system in the San Jacinto River once and for all, and dispose of it permanently so that the public does not have to worry about it in the future or bear the risks associated with leaving it in place in a storm-prone, aquatic environment. As documented in their March 2011 correspondence, both Waste Management and International Paper clearly recognized the likelihood of a removal and/or incineration remedy for the Waste Pits Site, although they discussed focusing their efforts instead to work on a global plan to build consensus with the Community to view the rock pile cap as part of the permanent remedial action at the site so that the waste could be left in place. The Community has made it clear to Harris County that it does not want the waste to be left in the San Jacinto River. Forty years of dioxin in the River is enough. It should be removed to eliminate any potential for continued exposure to human health and the environment so the River can begin the process of regenerating itself free of this dioxin source.

## II. The removal remedy is the alternative required by EPA's own criteria for remedy selection.

### A. A removal remedy achieves overall protection of human health and the environment.

The Waste Pits Site conditions themselves clearly dictate that removal is the only way that would *permanently* and effectively eliminate exposure to humans and the environment in a way to achieve overall protection of human health and the environment. The risks of exposure to human health are high since the dioxin waste at the Waste Pits Site is in an area of heavy recreational use by the men, women and children of Harris County – including those who continue to subsistence fish at the Waste Pits Site to feed their families and where commercial fisherman have been documented to harvest seafood destined for widespread distribution for public consumption. The risks of exposure to human health and the environment are real since fish and shellfish tissue samples collected near the Waste Pits Site indicated that the health-based standard was exceeded in 97% of

fish samples and in 95% of the crab samples.[5] Removal will unquestionably remove the source so that it can no longer impact humans or the environment -- unlike capping, treatment or other remedies that will allow the waste to remain in place subject to the constant and unrelenting impacts of tidal action, storms, major hurricanes, tropical depressions, floods, subsidence and its location in the direct path of a critical floodwater pathway and floodplain that will subject any in-place remedy to storm surges that will rush through the area at great force. Contrary to any in-place remedy that will be at risk of these elements, a removal remedy assures that human health and the environment will be protected from the 2,3,7,8-TCDD because it will no longer be present and subject to the elements or future risk of exposure.

In the past, the Potential Responsible Parties (PRPs) have recommended a PCL of 220 ng/Kg for dioxin TEQ, which is only protective of the occasional recreational user and is not protective of the subsistence user. We believe that cleanup levels should actually be established much lower than the 220 ng/Kg value, as is the case in many other dioxin superfund sites across the country, as shown in the table below. The existing fish advisories in the area are substantially a result of the waste at the Waste Pits Site migrating downstream and contaminating the Houston Ship Channel (HSC), Upper Galveston Bay, and associated side bays.

Dioxin Remediation Levels in Sediment at Superfund Sites

| Site | ROD Date | Dioxin TEQ (ng/Kg) | Notes |
|---|---|---|---|
| Lower Duwamish Waterway, Seattle, WA | April 2014 | 2<br>37<br>13<br>28 | Top 10 cm site-wide<br>Top 45 cm site-wide<br>Top 45 cm in clamming areas<br>Top 45 cm on beaches |
| Centredale Manor, North Providence, RI | Feb 2013 | 34<br>35 | Allendale, Lyman Mill sediment<br>Floodplain soil |
| Sonford Products OU2, Flowood, MS | Sept 2010 | 450 | Hydric sediment in industrial area |
| Commencement Bay Nearshore; Tacoma, WA | Aug 2003 | 7.4<br>20 | Site-specific background goal<br>SQC |
| McCormick & Baxter, Stockton, CA | Mar 1999 | 21 | |

If removal of the dioxin-contaminated sludge is not required at similar levels to these sites, then the ultimate sediment cleanup level will be many times higher than what

[5] EPA's Findings of Fact, Unilateral Administrative Order For Remedial Investigation/Feasibility Study issued to International Paper Company and McGinnes Industrial Management Corporation, November 20, 2009.

has been accepted at other sites. Should the citizens of Harris County accept less than what is required in many other parts of the country? The Waste Pits Site is as heavily used and is exposed to just as many of the storms, floods, hurricanes, etc. as other parts of the country, thus removal is the only long-term solution to permanently removing the waste from the system.

**B. A removal would achieve applicable or relevant and appropriate requirements (ARARS), unlike other alternatives.**

Removal of the dioxin will ensure that applicable or relevant and appropriate requirements are addressed, unlike other potential remedies that leave the dioxin waste in place. For example, in-place remedies would not be able to meet ARARs such as those associated with floodplain management and waterway obstructions. Construction of an in-place remedy in the floodplain and floodwater pathways would detrimentally impact flood control measures and activities, river pathway and water flow issues and raise issues regarding obstruction of waterways and related activities. Such activities are not allowed, except by permit and constructing in-place, permanent remedial structures that impact a key river and floodplain pathway, and would disfavor any other remedy except removal.

**C. A removal remedy would be a long-term permanent solution, to which the EPA gives preference as a remedy that permanently and significantly reduces the volume, mobility and toxicity of wastes.**

A removal remedy is permanent in that the toxic 2,3,7,8-TCDD source material will be eliminated and no longer available as a route of exposure to humans or the environment, either from direct exposure or ingestion of dioxin-laden seafood from fishing or commercial sale to the public. Removal also reduces all of the volume and any risk of mobility by taking it out of the Waste Pits Site and River sediments entirely. In a location where highly toxic materials in an aquatic environment are regularly subjected to extreme storm events, flooding and tidal forces, removal is the only remedy that can provide assurance of permanence from risk of continued exposure. In addition to eliminating exposure, a permanent removal reduces the volume, risk of mobility and the issue of toxicity altogether.

**D. Removal is the only Viable and Proven Alternative for Waste Pits Site.**

Harris County has attached a report titled "Techniques for Successful Contaminated Sediment Dredging." As the report establishes, dredging has been successfully performed to remove contaminated sediments at numerous sites in North America and throughout the world. Best Management Practices for dredging contaminated sediments have been used at many other locations and can be used at the Waste Pits Site. The report also makes the following points:

- The effectiveness of environmental dredging has improved significantly since the 1990s and early 2000s;

- The report describes methods to contain sediment particles that may become suspended during dredging and presents case histories where these were successfully used;
- The report describes best management practices that could be implemented for the Waste Pits Site;
- The depth of water is shallow (e.g. less than 5 feet deep) in all the Alternative 6N dredge areas, except for a small area on the northwest corner. The water depth is shallow in all the areas of highest dioxin contamination. In shallow water, it is very feasible to install a temporary solid containment structure around the dredge area. As described and shown in photos in the attached report, steel sheet piles have been successfully used at other sites to contain dredge areas. This would completely eliminate release of re-suspended sediment to the River; and
- Dredging inside a containment structure was not included in any alternative in the draft FS prepared on behalf of the PRPs. Therefore, impacts to water quality predicted in the FS are not based on using current best management practices for environmental dredging. The predicted impacts in the FS that the PRPs drafted are based on not using any method to control re-suspended sediment, which is not the appropriate way to perform environmental dredging.

The FS the PRPs drafted referenced six past dredging projects and purportedly used those to estimate the mass of sediment that would be released to surface water during dredging; however, these cases are not applicable to the Waste Pits Site. Five of the six projects listed were pilot studies which were done with contractors who had little to no experience with environmental dredging, and using equipment and methods for conventional dredging. The sixth site listed is the Upper Hudson River PCB Superfund dredging project performed by General Electric with EPA oversight. As referenced in the attached report, the EPA has stated that the project was completed in less time than expected and with less secondary impacts than predicted, such as re-suspending sediments into the water column during dredging. The EPA has stated that the Hudson River PCB Superfund dredging projects has been a success. Therefore, the results provided in the draft FS, from these past examples, are not applicable to the Waste Pits Site and should not be considered. Appropriate environmental dredging projects should be utilized as listed in the paper and recent reviews.

As explained in our 2014 letter, it is our belief that the cleanup level should be much lower than the proposed 220 ng/Kg, due to local studies and state criteria. We understand that due to unavoidable post-dredge residual contamination, it may not be feasible to achieve sediment concentrations less than 16 ng/Kg[6]; however, we believe every attempt should be made to reach as close to safe levels as possible. Harris County

[6] Harris County recommends the 16 ng/Kg for dioxin TEQ based upon the State of Texas fish tissue standard for dioxin.

believes that every effort should be made to remove contaminated soils and remove as much sediment as required to achieve the 16 ng/Kg, which is in line with cleanups at other dioxin sites.

**E. A removal remedy is implementable and has been successfully accomplished at a similar site in the area.**

In addition to removal through excavation, a similar aquatic site contaminated with DDT was remediated through the use of a bank-to-bank dredge to achieve a one-time removal of source material. This was in Harris County in Greens Bayou, a navigable tributary of the HSC. In that situation, DDT and other highly persistent organo-chlorine pesticides disposed of in the 1970s were discovered in high concentrations from historical manufacturing activities, and which had been discharged into a flood drainage ditch and submerged sediments in Greens Bayou. Fish and crabs were found to be heavily impacted with DDT. A bank-to-bank dredge was designed with six separate Dredged Material Management Units (DMMUs) for sequencing purposes. A required dredging depth in feet and the payable over depth of additional sediment to be removed below the required depth was designed with calculated sediment dredge volumes identified for each DMMU to include both the required depth and over-depth volume. Within six months after the completion of the dredging, a post-dredging sampling program was designed to confirm substantial removal of source material. This removal remedy was accomplished successfully and avoided having to place a cap or other engineered remedy into the waterway.

**F. A removal remedy is cost effective to remove special threat wastes from this high-risk environment because it will be a one-time action that will eliminate continued and future exposure to known or suspected carcinogens and achieve a permanent solution that avoids risks of remedy failure and long-term operational and maintenance (O&M) costs.**

A removal remedy will be a one-time remediation project that will remove forever the dioxin source material that has impacted the area for more than 40 years. It will also eliminate costs associated with long-term O&M, as well as continued maintenance and repair of any in-place remedy into perpetuity. Because removal will achieve all of the central goals of a permanent remedy and eliminate toxicity, mobility and volume of the dioxin, it is also cost-effective based upon overall effectiveness. This is particularly true when, as here, the dioxin source material is in a high-risk environment subject to storms, floods and severe meteorological impacts with high risks of impacts to any in-place remedy, and located in and highly utilized by humans for recreation and fishing. High risks of human exposure have already been documented and the dioxin has caused a serious public health threat associated with the distribution and ingestion of dioxin-impacted seafood. It would be surprising if a removal remedy were not selected based upon these considerations. The EPA has also recognized the risk of leaving the dioxin waste in place given the conditions and location of the Waste Pits Site noting that the

"percentage is too high of a risk of failure in the long term to be considered protective of human health and the environment and, in all likelihood, will not make a temporary cover designed for a storm even with a return event of 100 years a viable long-term remedial option."[7] The risk is simply too great to allow the 2,3,7,8 TCDD to remain in the Waste Pits Site and sediments of the San Jacinto River when weighing the risks of leaving highly toxic material in an aquatic environment subject to the certainty of impacts from severe storm events, and risking continued exposure to human health and the environment. The cost-effectiveness of a remedy that will forever remove the dioxin source material, achieve a permanent remedy and eliminate toxicity, mobility and volume of the dioxin and avoid remedy failure and long-term O&M into perpetuity is more than proportionate to the benefits gained, particularly since the overall goal of elimination of the continued and future exposure of the dioxin to human health and the environment is paramount and will be achieved by a removal remedy.

Even Waste Management and International Paper identified years ago that the Waste Pits Site would likely be subject to either a dig-and-haul or incineration requirement -- both removal remedies. The fact that they chose instead to promote the cheapest remedy -- leaving dioxin in the river covered with rocks -- does not alter the basic acknowledgement that this is highly toxic material that would be expected to be removed from the environment rather than leaving it in place subject to the elements and severe forces of nature that are well documented, will continue and will impact any remedy left in the San Jacinto River. Both Waste Management and International Paper's financial records, with revenues reported in the multiple-billions of dollars, indicate more than adequate financial capability to fund a removal remedy.[8]

## III. Other Issues.

Harris County has raised other issues with respect to RI/FS process for the Waste Pits Site that support its request that the dioxin-contaminated sludge be removed.

### A. Inadequate evaluation of storms, hurricanes, floods and tidal influences.

Harris County's review of the last draft of the Revised Feasibility Study noted that it failed to adequately address the risks of one of the greatest threats to leaving the dioxin contamination in place – clearly the alternative being promoted by the responsible parties – the severe and violent storms, hurricanes, floods and tidal influences that have and will continue to be a threat to the integrity of any in-place remedy they seek to obtain. This is

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[7] See EPA October 18, 2010 letter to Albert Axe on behalf of McGinnes Industrial Maintenance Corporation and International Paper Company.

[8] Waste Management, Inc. reported revenues of $13.6 billion in 2012. Source, Waste Management, Inc., SEC Form 10-K, year ended December 31, 2012. International Paper Company reported revenues of $27.8 billion in 2012. Source, International Paper, Inc., SEC Form 10-K, year ended December 31, 2012.

one of the central issues to evaluating an in-place remedy of principal threat wastes in an aquatic environment of the Gulf Coast which is subject to well-documented, major storm events, some of which are devastating in their violence and severity. As recently as 2008, Hurricane Ike struck the Texas coast and was so large that it caused devastation all the way from the Louisiana coastline through the coastal areas of Texas almost to Corpus Christi. In 2001, Tropical Storm Allison devastated southeast Texas, developing a tropical wave in the Gulf of Mexico that struck the upper Texas Coast and flooding Harris County. In 1994, remnants of Hurricane Rosa stalled over Texas to create the October Flood of 1994, which caused widespread and record flooding of rivers and reservoirs in Texas, including impacts to the San Jacinto River. More recently in April/May 2016, the area around the Waste Pits Site was hit with significant rains causing it to be inundated. These types of storms are foreseeable, predictable and will continue to occur. It is also not yet known how much of the dioxin material from the Waste Pits Site could have been or was washed into Galveston Bay and other river systems as a result of the effect of these storms on the Waste Pits Site. The only way to ensure that risk does not occur again is to remove the material from the threat caused by such storms.

### B. USACE draft report was conducted without adequate resources or review of existing data and information.

Harris County has not been provided with any further report from USACE about the Waste Pits Site. The EPA has indicated that the previous USACE draft report is undergoing revision; however, until such time as a revised report is released for comment, Harris County re-urges its previously submitted comments. As Harris County has stated before, we think that the USACE draft report has serious issues, including the following: 1) USACE did not consider the potential impact upon the Waste Pits Site of hurricanes or tropical storms, which we think makes the draft incomplete; 2) USACE did not consider the quarterly inspection reports for the armored cap showing the flaws in its design, construction, and maintenance; and 3) USACE did not even review its own November 2013 report in which it identified serious flaws in the armored cap. Simply put, the USACE in its draft report made comments and statements regarding the supposed viability of the armored cap for 500 years without looking at its own data showing that it did not last five years without needing repair and reassessment or consider the more recent information about the cap's failure.

### C. The EPA has insufficient information about southern impoundments to support a remedy and further study is required.

Harris County is familiar with the evaluation of the impoundments south of the I-10 bridge (Southern Impoundments). While those impoundments might not be in as close contact with the San Jacinto River as the Northern Impoundments, they are still on the banks of that vital River. The concerns about the storms, flood, and hurricanes releasing the contents of northern pits also apply to the Southern Impoundments. It is Harris County's position that the dioxin-contaminated waste in the Waste Pits Site north of I-10 bridge need to be removed and that if the EPA is considering permitting the

dioxin-contaminated waste in the Southern Impoundments to remain in place, then it should require further study and review of the effects of a hurricane or flood on those impoundments. In the absence of that information, a reasonably informed decision on permitting the contaminated waste in the Southern Impoundments to remain in place is not possible. Harris County is unaware of such a study being completed for either the impoundments, North or South of the I-10 bridge.

**D. Anonymous website information should be disregarded.**

Harris County is aware of the "Keep It Capped" website that fails to identify a single individual or business owner by name that supports or created it. This anonymous website contains information regarding five other sites where it claims dredging or excavation was not successful. The "Techniques for Successful Contaminated Sediment Dredging" report describes the deficiencies of each example and concludes that the results of these examples are not indicative of the performance of full-scale operations because they did not use the Best Management Practices and equipment that are available today for environmental dredging and did not have enclosures around the dredge areas. This anonymous website also claims that the cap was designed to withstand a 100-year storm, ignoring the repeated failures of the cap to maintain its integrity for five years under existing weather patterns.

**Conclusion.** Harris County thanks the EPA for the opportunity to provide this information to the NRRB. On May 1, 2014, Harris County requested that the NRRB require the removal of the dioxin-contaminated sludge from the San Jacinto River. Events since that letter make the need for that removal even more compelling. The cap, which was placed as a temporary remedy, has eroded significantly and required repeated repairs. The only appropriate remedy to effectively and permanently address the threats to human health and the environment from the Waste Pits Site is the removal of the dioxin-contaminated sludge.

Sincerely,

Vince Ryan
Harris County Attorney

cc: Gary Miller
Remedial Project Manager
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